

What is claimed is:

1. An optical switching element comprising:
a total reflection member having a total reflection face by which incident light can be totally reflected; and
a plurality of translucent light extracting portions constructing one pixel, each of which can be switched between a first position at which the light extracting portion comes into contact with or is close to the total reflection face of the total reflection member in a distance in which near field light can be extracted and a second position apart from the total reflection face by more than the distance in which the near field light can be extracted.
2. An optical switching element according to claim 1, wherein areas of faces for extracting incident light of at least two of the plurality of light extracting portions are different from each other.
3. An optical switching element according to claim 2, wherein areas of faces for extracting incident light of all of the plurality of light extracting portions are different from each other.
4. An optical switching element according to claim 3, wherein a ratio of the areas of the faces for extracting the incident light of the plurality of light extracting portions is 2^n (where n is an integer of 0 or larger).

5. An optical switching element according to claim 1, further comprising driving means for displacing the light extracting portion to either the first position or the second position in accordance with the leading direction of the incident light.

6. An optical switching element according to claim 1, wherein when the light extracting portion is in the second position, reflection light from the total reflection face of the total reflection member is used.

7. An optical switching element according to claim 1, wherein when the light extracting portion is in the first position, light passed through the total reflection member and the light extracting portions is used.

8. An optical switching element according to claim 1, wherein the optical switching element is used as a two-way light polarizing element using both total reflection light from the total reflection member and transmission light passed through the light extracting portions.

9. An optical switching element according to claim 5, wherein the total reflection member is a translucent substrate having a pair of parallel faces one of which is a light incident face and the other serving as either a total reflection face when the light extracting portion is in the second position or a light emitting face when the light extracting portion is in the first position.

10. An optical switching element according to claim 9, wherein a pair of V-shaped grooves are provided on the light incident face side of the translucent substrate, the incident light is led by one of the V-shaped grooves to the total reflection face, and reflection light from the total reflection face is led to the outside by the other V-shaped groove.

11. An optical switching element according to claim 9, wherein a microprism serving as an introducing portion of incident light and an emitting portion of reflection light from the total reflection face is disposed on the light incident face side of the translucent substrate.

12. An optical switching element according to claim 9, wherein a microcylindrical lens serving as an introducing portion of incident light and an emitting portion of reflection light from the total reflection face is disposed on the light incident face side of the translucent substrate.

13. An optical switching element according to claim 1, wherein the light extracting portion is a plate-shaped translucent substrate having a bridge structure.

14. An optical switching element according to claim 1, wherein on a face on the side opposite to the total reflection member side of the light extracting portion, a total reflection preventing portion for preventing total reflection by the light extracting portion of incident light passed through

the total reflection member when the light extracting portion is in the first position is provided.

15. An optical switching element according to claim 14, wherein the total reflection preventing portion is a translucent tapered portion having an angle at which total reflection does not occur, for leading incident light in a direction opposite to the total reflection member side.

16. An optical switching element according to claim 14, wherein the total reflection preventing portion is a light absorbing layer for absorbing incident light.

17. An optical switching element according to claim 9, wherein a total reflection light absorbing layer for absorbing reflection light from a total reflection face is provided on a face on the light incident side of the translucent substrate.

18. An optical switching element according to claim 9, wherein the translucent substrate has a total reflection portion for leading reflection light from the total reflection face toward an end face by repeating total reflection in the substrate, and deflects incident light into one of two directions: the direction to an end face of the translucent substrate; and the transmitting direction of the light extracting portion.

19. An optical switching element according to claim 1, wherein the driving means has a pair of transparent electrodes disposed on the total reflection face of the total reflection member and the light extracting portion so as to face each other, and voltage applying means for applying a voltage to the pair of transparent electrodes, and the light extracting portion is driven by electrostatic attraction generated by a potential difference between the transparent electrodes.

20. An optical switching element according to claim 9, further comprising another translucent substrate in a position opposite to the translucent substrate of the light extracting portion so as to face the total reflection member, on which light emitting from the light extracting portion is incident.

21. An optical switching element according to claim 20, wherein a light absorbing layer for absorbing light emitting from the light extracting portion is provided on a face on the light incident side of the other translucent substrate.

22. An optical switching element according to claim 20, wherein the driving means has:

three transparent electrodes disposed so as to face a total reflection face of the total reflection member, the light extracting portion, and a face opposite to the light extracting portion of the other translucent

substrate, and;

voltage applying means for applying a voltage to the three transparent electrodes, and

the light extracting portion is driven by electrostatic attraction generated by a potential difference between transparent electrodes.

23. A switching device having a plurality of optical switching elements,

wherein the optical switching element comprises:

a total reflection member having a total reflection face by which incident light can be totally reflected; and

a plurality of translucent light extracting portions constructing one pixel, which can be switched between a first position at which the light extracting portion comes into contact with or is close to the total reflection face of the total reflection member in a distance in which near field light can be extracted and a second position apart from the total reflection face by more than the distance in which the near field light can be extracted.

24. A switching device according to claim 23, wherein the switching device is a spatial light modulator in which the plurality of optical switching elements are arranged one-dimensionally.

25. An image display apparatus for displaying a two-dimensional image by irradiating a plurality of optical switching elements with light of

three primary colors and scanning light by a scanner,

wherein the optical switching element comprises:

a total reflection member having a total reflection face by which incident light can be totally reflected; and

a plurality of translucent light extracting portions constructing one pixel, which can be switched between a first position at which the light extracting portion comes into contact with or is close to the total reflection face of the total reflection member in a distance near field light can be extracted and a second position apart from the total reflection face by more than the distance in which the near field light can be extracted.